

Write the first 4 terms of each geometric sequence

19) $a_n = 3^n$

3, 9, 27, 81

20) $a_n = 4(5)^{n-1}$

4, 20, 100, 500

21) $a_n = 5(-2)^{n-1}$

5, -10, 20, -40

22) $a_n = 48\left(\frac{1}{2}\right)^{n-1}$

48, 24, 12, 6

Find the indicated term

23) a_6 if $a_1 = 3, r = 2$

$a_6 = 3(2)^5 = 192$

24) a_8 if $a_1 = -\frac{1}{4}, r = -2$

$a_8 = -\frac{1}{4}(-2)^8 = -64$

25) a_5 if $a_1 = 243, r = -\frac{1}{3}$

$a_5 = 243\left(-\frac{1}{3}\right)^5 = -1$

26) a_{10} if $a_1 = \frac{1}{24}, r = 2$

$a_{10} = \frac{1}{24}(2)^{10} = \frac{1024}{24} = \frac{128}{3}$

Find the missing numbers in each geometric sequence

27) 3, $\frac{6}{-6}$, $\frac{12}{12}$, $\frac{24}{-24}$, 48
or
 $\frac{6}{-6}$, $\frac{12}{12}$, $\frac{24}{-24}$
 $48 = 3r^4$
 $16 = r^4$
 $r = \pm 2$

28) -12, $\frac{24}{-8}$, $\frac{-48}{8}$, 96
 $96 = -12r^3$
 $-8 = r^3$
 $r = -2$

29) 5, $\frac{15}{-5}$, $\frac{45}{15}$, $\frac{135}{-45}$, 405
 $135 = 5r^3$
 $27 = r^3$
 $r = 3$

30) 81, $\frac{27}{81}$, $\frac{9}{1}$, $\frac{3}{-1}$, $\frac{1}{81}$
 $\frac{1}{81} = r^4$
 $r = \frac{1}{3}$

Find the sum of each of the following

31) $1 + 3 + 9 + 27 + \dots$ (8 terms) -
 $S_8 = \frac{1(1-3^8)}{1-3} = \frac{1-6561}{-2} = \frac{-6560}{-2} = 3280$

33) $\frac{1}{9} + \frac{1}{3} + 1 + \dots$ (5 terms)
 $S_5 = \frac{\frac{1}{9}(1-(-3)^5)}{1-(-3)} = \frac{\frac{1}{9}(1-(-243))}{4} = \frac{\frac{1}{9}(244)}{4} = \frac{244}{36} = \frac{61}{9}$

35) $a_1 = 243, r = -\frac{2}{3}, n = 5$
 $S_5 = \frac{243(1-(-\frac{2}{3})^5)}{1-(-\frac{2}{3})} = \frac{243(1-(-\frac{32}{243}))}{\frac{5}{3}} = \frac{243(\frac{275}{243})}{\frac{5}{3}} = \frac{275}{\frac{5}{3}} = 275 \cdot \frac{3}{5} = 165$

32) $8 + 4 + 2 + \dots$ (6 terms)
 $S_6 = \frac{8(1-(\frac{1}{2})^6)}{1-\frac{1}{2}} = \frac{8(1-\frac{1}{64})}{\frac{1}{2}} = \frac{8(\frac{63}{64})}{\frac{1}{2}} = \frac{1}{2} \cdot \frac{63}{8} = \frac{63}{16}$

34) $a_1 = 7, r = 2, n = 10$
 $S_{10} = \frac{7(1-2^{10})}{1-2} = \frac{7(1-1024)}{-1} = -7(-1023) = 7161$

36) $a_1 = 7, a_n = 700, r = 10$
 $S_3 = \frac{7(1-10^3)}{1-10} = \frac{7(-999)}{-9} = \frac{7(-999)}{-9} = 7(111) = 777$